

NAMPA FISH HATCHERY

ANNUAL REPORT

January 1, 1991 - December 31, 1991

Prepared by:

Walt Rast, Superintendent II  
Rick L. Lowell, Superintendent I  
Rob Morris, Fish Culturist

## INTRODUCTION

Nampa Hatchery is a resident trout rearing facility located two miles south of Nampa. The water supply includes eight artesian wells with a combined flow of 18 to 40 cfs of 59°F water. Built in 1975, and purchased by the Idaho Department of Fish and Game in 1982, the fish rearing facilities consist of: a hatchery crew quarters building with 4 upwelling incubators and 4 early rearing vats; outside rearing tanks include 16 fry raceways, 3 fingerling raceways, and 10 production raceways. Up to nine additional upwelling incubators can be used in the fry raceways to increase egg incubating capacity. A settling pond treats flows from the production units before discharge into Wilson drain.

## FISH PRODUCTION

Nampa Hatchery stocked 2,550,346 fish totalling 224,013 lbs during 1991. In addition, 7,482 lbs of broodstock were produced for a combined total weight of 231,495 lbs. This represents a 59% decrease over the previous years production. Further breakdown by size is listed in Tables 1, 2, and 3. Rainbow trout of various strains were the major fish produced totalling 1,697,363 fish and 192,463 lbs. In addition, Kamloops Oncorhynchus mykiss, brown trout Salmo trutta, and Lahontan cutthroat trout Oncorhynchus clarki henshawi were produced (Table 4).

Total production, cost per fish, and cost per pound of each species/strain is listed on Tables 1, 2, and 3.

A total of 4,522,490 eggs were received during the fish year 1991 (Table 5).

### Brown Trout

Nampa Hatchery received 150,000 brown trout eggs from Saratoga National Fish Hatchery in Saratoga, Wyoming on November 29, 1990. Early survival rate was excellent with a 26% increase over the previous two years. Additional fish health information on brown trout is presented in the fish health section. A total of 114,830 brown trout fingerlings were stocked between May and September.

### Lahontan Cutthroat Trout

During the 1991 fish year, Nampa Hatchery stocked 416,745 Lahontan cutthroat trout into lakes and reservoirs located in Regions 2, 3, 5, and 6. All Lahontan cutthroat eggs received this year came from the Omak Hatchery in Washington.

## HATCHERY IMPROVEMENTS

Ten automatic Ziegler Brothers belt feeders were purchased for fry production. They worked especially well with exotic species.

The cement bridge to the island on the settling pond was removed and buried, turning the island into a peninsula. The bridge was deteriorating and sinking into the ground. Engineering filled it in with fill from Wilson Springs ponds.

The deck and trim on the office building was painted. New headrace covers were designed, built, and installed on both the fingerling ponds and two production raceways. The covers for the production raceways do not cover as much area, but lids over the pack columns are hinged for easier access to the dam boards.

The sprinkler system was changed and some new sprinklers, made by Rainbird called Maxipaws, were used to replace the old sprinkler heads that were not giving the coverage we needed.

A new natural gas Day and Night furnace and air conditioner was installed in the office replacing the old air-to-air heat pump.

A new larger backup generator was purchased to replace the old one for the wells inside the hatchery property; this will backup new larger well pumps, as they come on line, in the future. Additional plans include moving the water up and dropping it through packed columns to remove nitrogen gas and increase oxygen thus improving quality of water. This generator will operate on natural gas.

## FISH HEALTH

Bacterial gill and coldwater disease was the most prevalent pathogen at Nampa Hatchery during fish year 1991. Gill disease occurred primarily during the spring months when the hatchery was at full capacity. Coldwater disease did not appear to be as acute this year compared to last. During 1991, every lot of fish was fed a starter diet containing Oxytetracycline Hydrochloride. A typical dose of medication was 2.5 to 3.8 g/100 pound of fish for approximately two weeks. Hatchery disease records, as well as pathology test results, indicated a decrease in the frequency of coldwater disease outbreaks in larger fingerlings and catchable-size trout (Table 6). However, hatchery inventory records suggest the greatest percentage of loss occurs during incubation and early rearing.

In the past, both brown trout and Lahontan cutthroat trout have been difficult to raise at Nampa Hatchery. However, during 1991, a significant increase in survival from eyed egg to planting was observed in both species. Brown trout survival increased from 50% to 76%, while Lahontan cutthroat trout survival went from 60% to 72%. The major reasons are: 1) both brown trout and Lahontan cutthroat trout were started on Biodiet softmoist feed, and 2) automatic

NAMPA91

belt feeders were used to feed the fish. Brown trout and Lahontan cutthroat trout yielded the best overall survival from egg-to-plant than any other lot of fish cultured during 1991 at Nampa Hatchery.

Prior to 1991, most rainbow trout strains had significantly higher survival rates than brown trout or Lahontan cutthroat trout. Biodiet feed appears to enhance early rearing survival for specialty species at Nampa Hatchery. Use of Biodiet starter feeds will probably be expanded during 1992.

Also during 1991, Nampa Hatchery raised Kamloop (Duncan River strain) for the first time. This strain is very wild and yielded poor survival (30%). Severe pinheading was the primary cause of mortality. Culture techniques will be modified during 1992 to improve survival.

Bird predation, primarily from Black Crowned Night Herons, during the 1991 fish year continued to exacerbate fish health problems. In addition to direct loss, birds also spread potentially sick fish from pond to pond.

#### **FISH TRANSFERRED**

During 1991, the Kamiah redistribution project was reassigned to the Clearwater Hatchery. A total of 36,163 (9"+) rainbow trout weighing 11,544 pounds were transferred to the Kamiah holding pond and stocked in Region 2 waters. In addition, 83,870 (9"+) rainbow trout and 4,554 (5") brown trout were transferred to the Clark Fork Hatchery. Nampa Hatchery also transferred 2,206 R9 broodstock, weighing 6,558 pounds, to the Hayspur Hatchery. Surplus broodstock was combined with catchable-size rainbow trout and stocked in Region 3 waters.

#### **FISH SPAWNING**

##### **Deadwood (Early Kokanee)**

Nampa Hatchery continues to operate the early kokanee salmon Oncorhynchus nerka (KE) trapping and spawning project at Deadwood Reservoir. Deadwood Reservoir remains a viable source for KE eggs.

Significant changes occurred in trapping techniques for KE during 1991. A steep-pass fish ladder was used instead of a conventional picket weir. Some problems surfaced initially with the fish ladder. At first, one section of the ladder was used. However, the kokanee salmon would not volitionally ascend the ladder. Therefore, two additional sections were attached, and a temporary weir was constructed to funnel the fish into the ladder (Figure 1). Trapping of KE adults started on August 8, 1991 and ended on September 12, 1991.

Run timing continued to be unpredictable when compared with runs from the last five years. The run was two weeks later than in 1990, when the trapping and spawning operation ended on August 31. All fish were spawned at the trap site.

An egg yield of 2,154,409 eggs was taken from 7,233 females for a fecundity rate of 298 eggs per female (Table 7). Average total length of female and male kokanee was 251.90 mm and 249.80 mm, respectively (Figure 2). Fecundity, along with average total length of spawning females, declined significantly in 1991 (Figure 3). Egg eye-up continued to improve over the last three years, with average eye-up in 1989 being 72%, 1990 at 85%, and 1991 at 90%. Results from pathological examinations are presented in Table 6.

All eggs were shipped to Mackay Hatchery via fixed-wing aircraft. Prior to shipping, green eggs were placed in 40-quart coolers filled with 50°F river water. Approximately 100,000 to 150,000 eggs were placed in each cooler and the cooler lids sealed with 6-inch wide duct tape. The Department contracted out the flying service with McCall Air Taxi. The plane would usually fly from McCall to Deadwood, then to Mackay. Total flight time averaged under two hours per flight, for a cost of approximately \$2,100. Estimated total cost of the Deadwood Project in terms of cost per 1,000 eggs was \$6.00/1,000 eggs. This includes personnel, camp groceries, and transportation.

Surplus adult kokanee salmon were outplanted again this year. Both Ashton Hatchery and McCall Hatchery personnel assisted in hauling the surplus fish. Moose Creek, a tributary to Island Park Reservoir, received 2,640 KE adults, while 5,280 KE adults were released into the South Fork Boise River upstream from Anderson Ranch Reservoir.

#### **Owyhee County (Lahontan Cutthroat)**

During May and June of 1991, hatchery personnel initiated a sampling project on four Owyhee County reservoirs to determine spawn timing and presence of pathogens of Lahontan cutthroat trout. Reservoirs sampled were: Shoofly, Bybee, Little Blue, and Grassmere (Figure 4). Trap nets were the primary gear used to capture the fish. Shoofly Reservoir was sampled on May 16, 1991 and yielded the most encouraging results, with 69 fish captured in one overnight set. Average total length was approximately 13 inches, and 80% of the females sampled were ripe (Figure 5). Pathological examinations revealed negative results for bacteria and virus (Table 6). The largest fish sampled out of all four reservoirs was a 17-inch male from Grassmere. Lahontan cutthroat trout were first stocked into the Owyhee County reservoirs in September 1988 at an average length of 3.12 inches.

#### **FISH FEED**

A total of 278,260 pounds of feed was purchased during 1991 from the following sources: Rangen, Inc.; Clear Springs, Inc.; BioSponge, Inc.; and

NAMPA91

Bioproducts. The overall feed *conversion* was 1.2 pounds of feed to produce one pound of fish. Table 8 gives the breakdown of feed costs.

#### **FEED EXPERIMENT**

Nampa Hatchery personnel conducted a 60-day feed experiment commencing on January 4, 1991 and ending on March 4, 1991. Three brands of feed were compared: Rangens, Clear Springs, and BioSponge. Hatchery constants for Rangens and Clear Springs were set at 15 while BioSponge remained at 12.1. All three groups of fish received the same water flow and space.

Sample counts and total lengths were recorded at the end of each month. Two Babington demand feeders were set up on each pond, and the entire days ration was weighed out into the feeders. No significant differences were observed between the three brands of fish feed. However, Clear Springs produced the lowest length increase and highest feed conversion ratio (Table 9).

#### **PUBLIC RELATIONS**

Every year there is an increase in the numbers of visitors at the Nampa Hatchery. A breakdown of scheduled appointments for guided tours was given to such organized groups as;

Scouting: 14 tours, 165 boys and leaders, and  
School: 25 tours, 1,187 students, and  
Idaho Women for Agriculture: 1 tour, 293 ladies in 4 buses.

Nampa Fish Hatchery personnel gave two luncheon presentations on the fish hatchery, new regional office, and Wilson Springs ponds on the future and purpose of each pond.

Nampa Fish Hatchery personnel gave three presentations on Department careers to high school biology classes.

Service projects on cleaning up the hatchery grounds were done by about 80 children from four scout and church groups. Each was out at different times of the year. They were given equal fishing time in the settling pond. They put in 320 hours of service, and each really made an improvement in the looks of hatchery grounds.

Another group of 190 children put in three hours cleaning up around Wilson Springs ponds for 570 hours, mostly chopping out weeds and raking the ground. This really looked good after completion, and they fished and played volley ball after the service project was done.

Table 1. Fingerling Production at Nampa Hatchery, 1991.

Species/ strain	Source & date	Number received	Yield number	Yield pounds	Percent egg to plant	Destination	Costs to produce & stock	Cost/ fish	Cost/ pound
Rainbow/R9	Hayspur	637,162 11/90	438,910	20,660	69	Region 3	\$28,554	\$0.065	\$1.38
Browns/BN	Saratoga	150,000 11/90	114,830	6,038	76.5	Regions 3, 4, 5	\$7,470	\$0.065	1.24
Kamloop Duncan River	Ennis 2/91-3/91	1,010,888	321,408	10,022	32	Regions 1, 2, 6	\$20,910	\$0.065	2.09
Rainbow/R7	Creston 2/91-4/91	1,748,044	907,712	46,479	52	Regions 3, 5	\$59,053	\$0.065	1.27
Cutthroat/C6	Omak* 5/90	810,768	181,335	9,350	60	Regions 3, 5	\$11,797	\$0.065	1.26
Cutthroat/C6	Omak 5/91	325,000	235,410	6,140	72	Regions 3, 5, 6	\$15,315	\$0.065	2.49
Totals			2,199,6	98,689			\$143,099		

\*This lot of fish was carried over from the previous fish year, thereby reducing the cost/lb of fish for year 1991.

Table 2. Catchable production at Nampa Hatchery, 1991.

Species/ Strain	Source & date	Number receiv	Yield number	Yield pounds	Percent surviva egg to plant	Destination	Costs to Produce and	Cost/ fish	Cost poun
Rainbow/R4	Mt. Lassen 5/90	200,000	108,196	37,197	54	Region 1,2,3	\$39,146	\$0.36	1.05
Rainbow/RE	Ennis 7/90-9/90	546,944	200,935	70,252*		Region 2,3	72,700	0.36	1.03
Rainbow/R1	Erwin 9/89	72,000	41,610	17,875	58	Region 1,3	15,055	0.36	1.01
Totals			350,741	125,324			\$126,901		

\*22,016 fish were carried over to fish year 1992.

Table 3. Broodstock production at Nampa Hatchery, 1991.

Species/ Strain	Source & date	Number receiv	Yield number	Yield pounds	Percent surviva egg to plant	Destination	Costs to Produce and	Cost/ fish	Cost poun
Rainbow/R9	Hayspu 5/90	8,755	2,306*	6,866	N.A.	Hayspur	\$1,521	\$0.6	\$0.2
Rainbow/R9	Hayspu 7/91	4,966	4,756	4,100	N.A.	Hayspur	1,521	0.66	0.22
Totals			7,062	10,966			3,042		

\*Surplus broodstock were stocked with catchables and included in catchable production.



Table 4. Fish requested and produced (1991).

Species & size	Production goal	Actual production	Percentage of goal achieved
Rainbow - 8+ inches	370,000	350,741*	95%
Brown - <6 inches	83,000	114,830	138%
Lahontan - <6 inches	235,500	416,745	177%
Kamloop - <6 inches	377,000	321,408	85%
Rainbow - <8 inches	1,296,500	1,346,622	156%
Totals	2,362,000	2,550,346	108%

\*Fish Requests for Middle Fork Boise River and Wilson Springs Ponds were canceled for 1991.

Table 5. Eggs received at Nampa Fish Hatchery January 1, 1991 to December 31, 1991

Species strain	Date received	Source	Number	Percent hatch	Destination	Expected yield	Cost/1,000
Kamloop/KD	01/05/91	Ennis	378,630	70	Region 1,2,3	321,408	N/C
Kamloop/KD	02/12/91	Ennis	494,900	70	Region 1,2,3	*	N/C
Rainbow/R7	02/20/91	Creston	520,900	70	Region 3,5	907,712	N/C
Rainbow/R7	03/05/91	Creston	383,872	70	Region 3,5	*	N/C
Rainbow/R7	03/19/91	Creston	419,000	70	Region 3,5	*	N/C
Kamloop/KD	03/19/91	Ennis	137,358	70	Region 1,2,3	*	N/C
Rainbow/R7	04/02/91	Creston	425,000	70	Region 3,5	*	N/C
Cutthroat/C6	05/03/91	Omak	325,000	70	Region 2,3,5,6	235,410	N/C
Rainbow/R4	06/27/91	Mt. Lassen	225,000	70	Region 2,3	145,000	\$10.0
Rainbow/R1	09/04/91	Ennis	175,590	70	Region 1,2,3	130,000	N/C
Kamloop/K1	09/04/91	Gloyd's	42,240	70	Region 2,3	26,000	\$10.0
Kamloop/K1	10/01/91	Gloyd's	185,000	70	Region 1,2,3	117,000	\$10.0
Brown/BN	11/14/91	Saratoga	200,000	70	Region 1,3	150,000	N/C
Rainbow/R9	11/15/91	Hayspur	100,000	70	Region 3	70,000	N/C
Rainbow/R9	11/22/91	Hayspur	60,000	70	Region 3	45,000	N/C
Rainbow/R9	12/05/91	Hayspur	300,000	70	Region 3	210,000	N/C
Rainbow/R9	12/13/91	Hayspur	150,000	70	Region 3	105,000	N/C
Total			4,522,490			2,462,530	

\*Percent hatch is not actually calculated, only estimated.

Table 6. Pathology test results, Nampa Hatchery, 1991.

Species/strain	Sample Date (91)	VH	VP	VE	VP	BK	BF	BR	BC	PX	PW	PC	PC	COMMENTS
Hayspur/R9	1-17	-	-				-	-	+					7/12 BC, 0/20 viro Rec. incubation Changes, TM100 at First feeding, Evaluation Oxolinic Acid. BC prob. Epizootic.Mortality Ave. 0.2%/day for 6 days
Lahonton/C6	2-11					-	-	-	+					BK: 0/8, 3.8 BC, 3/8 A. hydrophila (clinical)0.1%/day 0/10 gill para.
Wyetheville/R1	2-11						-	-	+					¾ BC, 2/4 Pseudomonas (both Clinical).TM100rec. When fry pm feed 7-21 days.
Kamloops/K6	3-18	-	-				-	-	-					0/5 viro, 3/3 Aeromonas (carrier) 0/5 viro
Kamloops/K6	3-18	-	-											Viro & bacty: 0/4. Presumptive EGD. BK 0/12, PW 0/13, Viro: 0/15 Bacty: 0/3 Environmental gill Disease. BC: 4/6 spleen 1/6 brain,viro 0/15 Severe gill necrosis Caused by excessive KMnO4. BK (ELISA) 2/31; BK (FAT) 0/31 (eggs transferred to Mackay and Ashton by Nampa personnel).viro0/60 (30 OF, 30 KSPC). PC 0/24, BK (FAT) 0/30 viro 0/30
Wyetheville/R1	5-16	-	-					-	-	-				
Lahonton/Feral	5-16	-	-				-							
Hayspur/R9	5-20							-	-	-				
Eagle Lake/R7	5-28	-	-			+								
Kokanee/KL (WBC)	9-10	-	-			+								
Kokanee/KL (DWR)	9-10	-	-			-						-		

Table 7. Kokanee egg take at Deadwood Reservoir (1991).

Take	Spawn Date	Females	Green Eggs	Eyed Eggs	% Eye
1	Aug 29	609	175,558	132,529	75.5
2	Aug 30	406	113,596	96,385	84.8
3	Sep 3	701	204,818	134,250	65.5
4	Sep 5	1,002	297,761	287,434	96.5
5	Sep 6	1,626	469,392	445,781	94.9
6	Sep 10	1,741	516,349	481,926	93.3
7	Sep 12	1,148	376,935	361,444	95.9
Totals		7,233	2,154,409	1,939,749	90.0

Table 8. Fish Feed used during 1991 at Nampa Hatchery.

Size	Source	Pounds	Cost/ pound	Cost
Starter	Rangens	260	\$0.53	\$138.25
#1 Dry	Rangens	1,000	0.45	455.00
#1 Dry	Biosponge	600	0.37	222.72
#1 Dry/TM	Rangens	1,900	0.48	921.00
#2 Dry	Rangens	9,250	0.40	3,705.50
#3 Dry	Rangens	21,600	0.39	8,549.00
#4 Dry	Rangens	57,360	0.25	15,188.10
#5 Dry	Clear Springs	2,000	0.23	479.80
Coarse Crumbles	Rangens	30,656	0.34	10,458.45
1/8"				
Pellet	Clear Springs	15,360	0.19	2,947.58
3 mm	Biosponge	1,000	0.27	272.50
5/32"				
Pellet	Rangens	115,290	0.21	24,645.83
1/4"				
Brood	Rangens	18,990	0.24	4,740.68
5 mm	Biosponge	1,000	0.27	272.50
Soft-Moist Starter	Rangens	110	0.72	79.75
Soft-Moist 1/32"	Rangens	880	0.65	576.40
# 1	Bio Products	224	0.48	108.00
# 2	Bio Products	256	0.63	163.27
# 3	Bio Products	180	0.80	144.00
1 mm	Bio Products	264	0.75	200.40
1.3 mm	Bio Products	80	1.56	124.80
Totals		278,260	\$0.27	\$74,393.53

Table 9. Feed experiment results, from Nampa Hatchery, 1991.

	<u>Ranget</u>	<u>C.S.</u>	<u>B.S.</u>
Number of fish	35,297	35,786	34,863
Fish per pound	2.89	3.47	3.38
Length in inches	9.14	8.72	8.67
Length increase for 60 days (in)	2.08	2.00	2.09
Standard deviation in length	21.47	17.77	18.48
Total pounds of gain	6,617	5,571	5,834
Total pounds of feed used	6,970	6,415	5,042
Feed conversion ratio	1.04	1.15	0.86
Hatchery constant	15.0	15.0	12.1
Cost/lb fish gained	0.228	0.230	0.246
Total cost	\$1,533.40	\$1,283.00	<b>\$1,436.97</b>

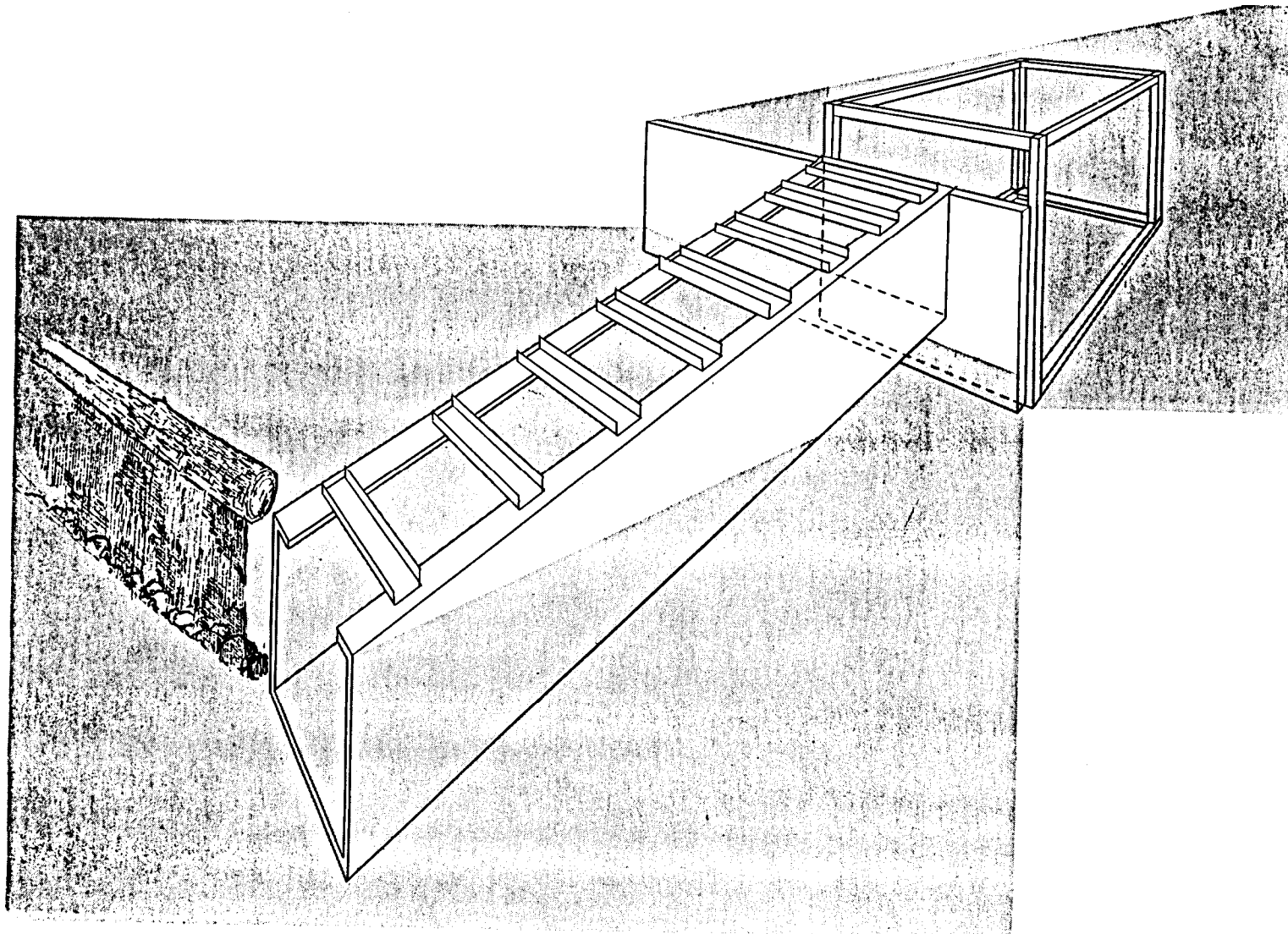
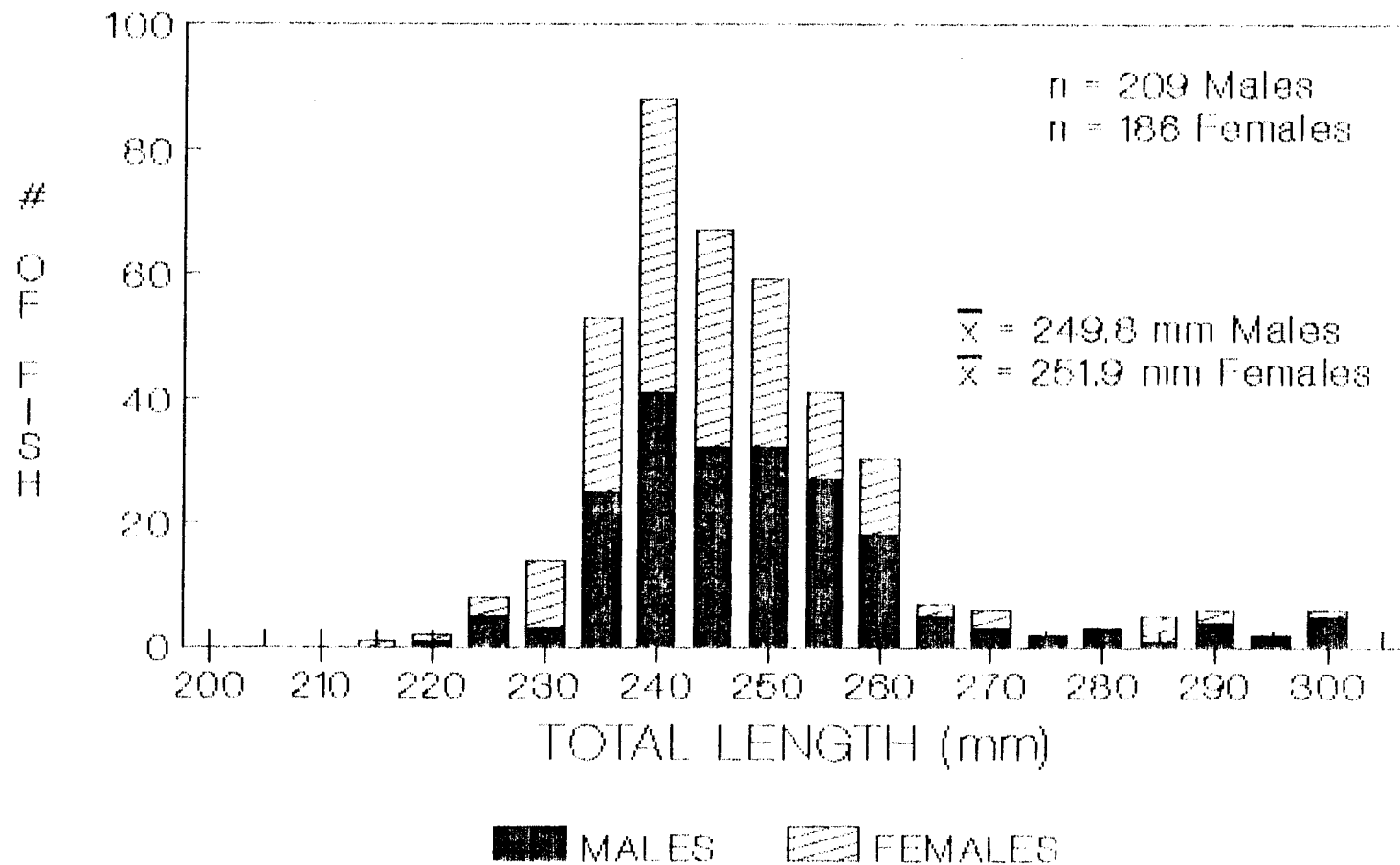


Figure 1. Steep pass fish ladder and weir used to trap kokanee, 1991.

# DEADWOOD RES. 1991 KOKANEE LENGTH FREQUENCY



Spawn 9/3/91

Figure 2. Average total lengths of male and female kokanee. Deadwood Reservoir, 1991.



# LENGTH, FECUNDITY, AND EGG TAKE of Deadwood Kokanee (1986-1991)

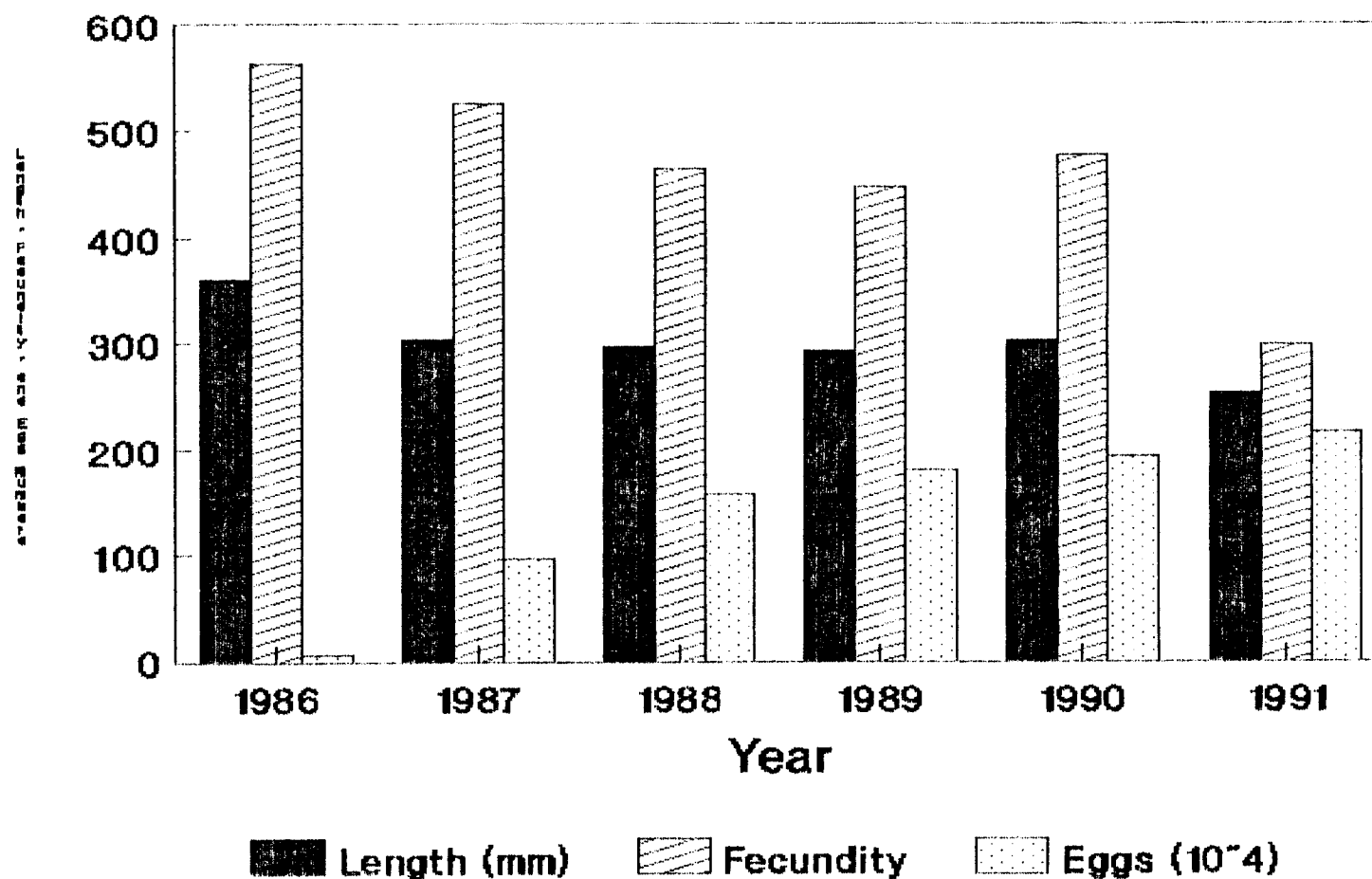


Figure 3. Comparison of length, fecundity, and egg take of Deadwood Reservoir kokanee. 1991.

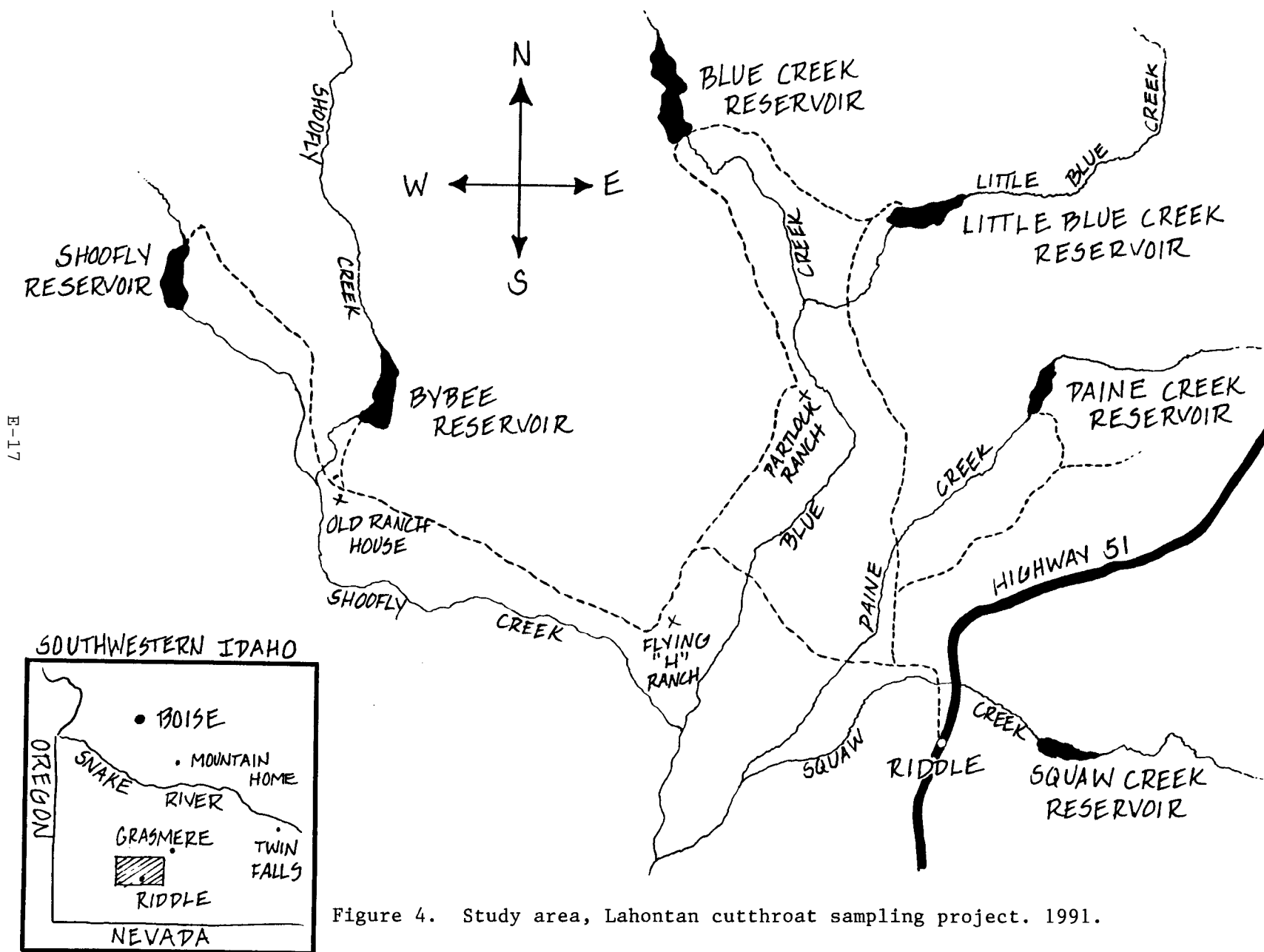


Figure 4. Study area, Lahontan cutthroat sampling project. 1991.

# SHOOFLY RESERVOIR 1991

## LENGTH FREQUENCY (N=69)

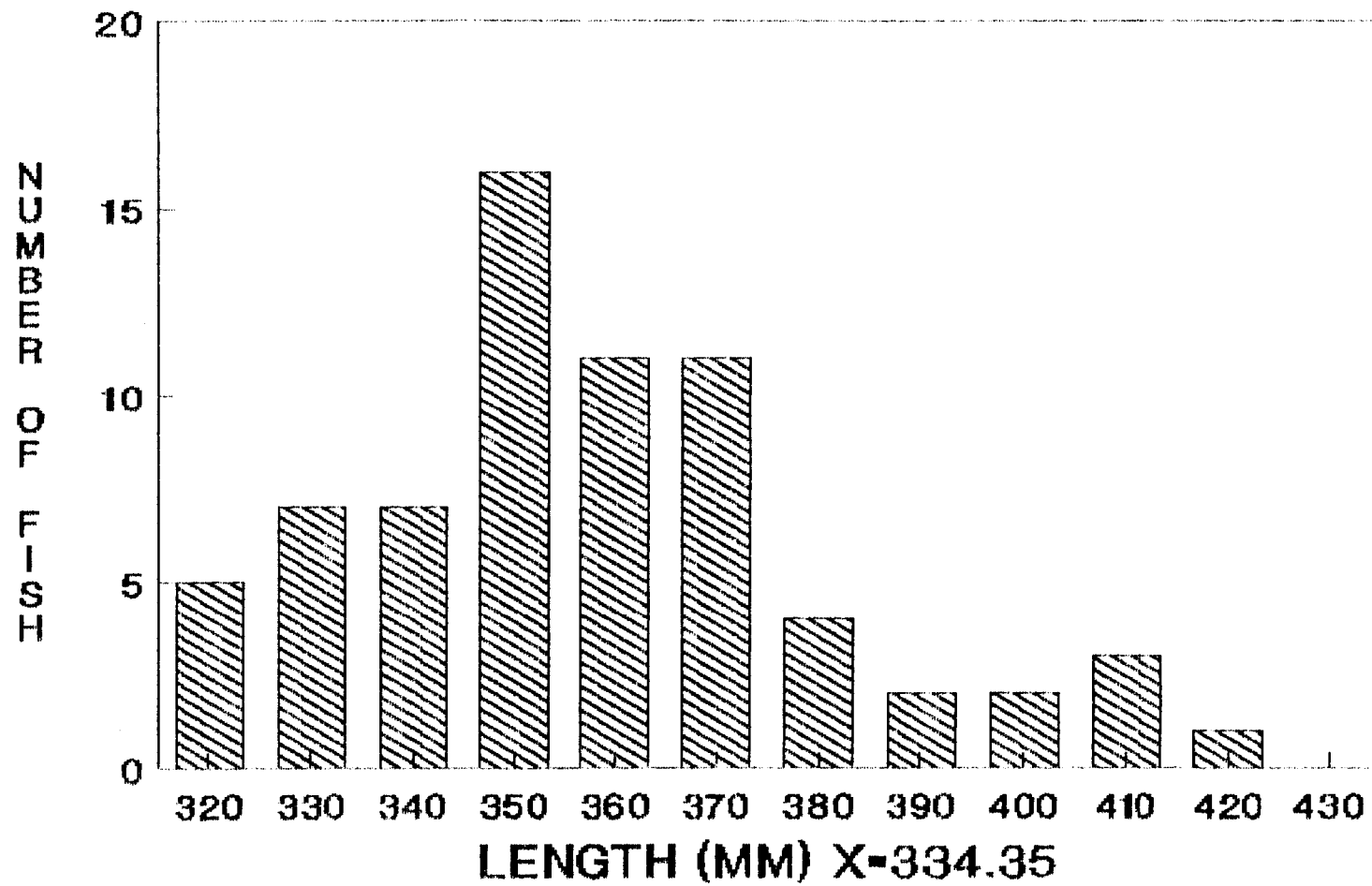


Figure 5. Lahontan cutthroat length frequency, Shoofly Reservoir. 1991.